- **Low Input Bias Current . . . 50 pA Typ**
- **Low Input Noise Current 0.01 pA/$\sqrt{Hz}$ Typ**
- **Low Supply Current . . . 4.5 mA Typ**
- **High Input impedance . . . 10^{12} Ω Typ**
- **Internally Trimmed Offset Voltage**
- **Wide Gain Bandwidth . . . 3 MHz Typ**
- **High Slew Rate . . . 13 V/μs Typ**

D OR P PACKAGE (TOP VIEW)

1OUT	1	8	V_{CC+}
1IN –	2	7	2OUT
1IN+	3	6	2IN–
V_{CC-}	4	5	2IN+

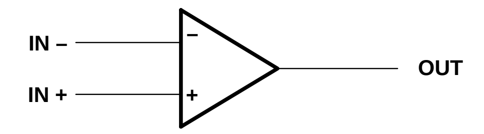
description

This device is a low-cost, high-speed, JFET-input operational amplifier with very low input offset voltage and a specified maximum input offset voltage drift. It requires low supply current yet maintains a large gain bandwidth product and a fast slew rate. In addition, the matched high-voltage JFET input provides very low input bias and offset currents.

The LF412C can be used in applications such as high-speed integrators, digital-to-analog converters, sample-and-hold circuits, and many other circuits.

The LF412C is characterized for operation from 0°C to 70°C.

symbol (each amplifier)



AVAILABLE OPTIONS

T_A	V_{IO}max AT 25°C	PACKAGE	
		SMALL OUTLINE (D)	PLASTIC DIP (P)
0°C to 70°C	3 mV	LF412CD	LF412CP

The D packages are available taped and reeled. Add the suffix R to the device type (ie., LF412CDR).

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC+} . . . . 18 V
Supply voltage, V_{CC-} . . . . –18 V
Differential input voltage, V_{ID} . . . . ±30 V
Input voltage, V_I (see Note 1) . . . . ±15 V
Duration of output short circuit . . . . unlimited
Continuous total power dissipation . . . . 500 mW
Operating temperature range . . . . 0°C to 70°C
Storage temperature range . . . . –65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . 260°C

NOTE 1: Unless otherwise specified, the absolute maximum negative input voltage is equal to the negative power supply voltage.



recommended operating conditions

	MIN	MAX	UNIT
Supply voltage, V_{CC+}	3.5	18	V
Supply voltage, V_{CC-}	–3.5	–18	V

electrical characteristics over operating free-air temperature range, $V_{CC\pm} = \pm 15$ V (unless otherwise specified)

PARAMETER		TEST CONDITIONS	T_A†	MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	$V_{IC} = 0$, $R_S = 10$ kΩ	25°C		1	3	mV
α_{VIO}	Average temperature coefficient of input offset voltage	$V_{IC} = 0$, $R_S = 10$ kΩ			10	20‡	μV/°C
I_{IO}	Input offset current§	$V_{IC} = 0$	25°C		25	100	pA
			70°C			4	nA
I_{IB}	Input bias current§	$V_{IC} = 0$	25°C		50	200	pA
			70°C			8	nA
V_{ICR}	Common-mode input voltage range			±11	–11.5 to 14.5		V
V_{OM}	Maximum peak output voltage swing	$R_L = 10$ kΩ		±12	±13.5		V
A_{VD}	Large-signal differential voltage	$V_O = \pm 10$ V, $R_L = 2$ kΩ	25°C	25	200		V/mV
			Full range	15	200		
r_i	Input resistance	$T_A = 25°C$			10^{12}		Ω
CMRR	Common-mode rejection ratio	$R_S \le 10$ kΩ		70	100		dB
k_{SVR}	Supply-voltage rejection ratio	See Note 2		70	100		dB
I_{CC}	Supply current				4.5	6.8	mA

† Full range is 0°C to 70°C.
‡ At least 90% of the devices meet this limit for α_{VIO}.
§ Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperatures as close to the ambient temperature as possible.
NOTE 2: Supply-voltage rejection ratio is measured for both supply magnitudes increasing or decreasing simultaneously.

operating characteristics, $V_{CC\pm} = \pm 15$ V, $T_A = 25°C$

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
V_{O1}/V_{O2}	Crosstalk attenuation	f = 1 kHz		120		dB
SR	Slew rate		8	13		V/μs
B_1	Unity-gain bandwidth		2.7	3		MHz
V_n	Equivalent input noise voltage	f = 1 kHz, $R_S = 20\,\Omega$		18		nV/$\sqrt{Hz}$
I_n	Equivalent input noise current	f = 1 kHz		0.01		pA/$\sqrt{Hz}$